CONFERENCE REPORT

LOCATION [redacted] **DATE HELD** Friday, June 3, 1960

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REFERENCE Conference Report dated 4/20/60

PRESENT **Company Personnel** **Others**

[redacted]

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D.E.B. - Vehicle Mfg.Rep.
H.C.L. - Vibration Consultant
L.E.W. - Customer Rep.

PURPOSE Determine: (a) Quantity of reaction points
(b) Location of reaction points
required for structural coupling of equipment to vehicle during the "caged" & "uncaged" conditions.

BACKGROUND INFORMATION

For a discussion of the design criteria for the "caged" and "uncaged" condition see addendum of reference (1).

STATEMENT OF PROBLEM

(A) Quantity of reaction points

Optimum conditions for the "caged" and "uncaged" conditions dictate six vehicle mounting points. Simplicity of installation dictates three vehicle mounting points.

(B) Location of reaction points

The forward low frequency vibration isolation mounts interfere at station 358 with the air duct running fore and aft.

SUMMARY OF MEETING

(A) Two schemes were presented for discussion. Each scheme with relative advantages and disadvantages are discussed in Addendum I.

(B) Data on vibration and navigation and other miscellaneous subjects were presented and requested. This information is documented in Addendum II.

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ACTION TO BE TAKEN

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Layout -

1) Move two forward low frequency isolators upward to obtain clearance for air duct. Move rear low frequency isolator downward required amount to maintain optimum vibration isolation conditions.

2) Devise mounting brackets to combine low frequency isolators and cagers for structural coupling to vehicle.

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Devise rear caging mechanism and locate to clear newly located low frequency vibration isolator.

Prepare specifications covering relationship of flight profile and caging.

D. E. B.

1) Develop alternate air duct proposal to alleviate interference with low frequency vibration isolators. Consider oval shaped duct.

2) Layout of two similar mounting plates each side of vehicle at stations 344 and 358.

CONCLUSION

1) No compromise of optimum vibration isolation should be conceded at this time.

2) Proceed with scheme I consisting of six reaction points and investigate eliminating interference problems as described herein.

3) More study of relationships between flight profile, caging and stabilization.

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ADDENDUM NO. I

SCHEMES I & II

SCHEME I

A. Description

Quantity and location of reaction points as described in addendum of reference 1. Parts consist of a frame and a platform.

B. Advantages

Optimum conditions for -

1. "uncaged" condition maximum vibration isolation thru low frequency isolators.

2. "caged" condition with line of force for crash thru the c.g. of platform to aft "cager".

C. Disadvantages

1. Quantity of reaction points - requires six reaction points, consisting of three each for the "caged" and "uncaged" condition.

2. Location of reaction points. Forward low frequency vibration isolators are too low in vehicle interferring with air duct.

In more detail, this interference occurs when the forward isolators are in a common plane with the platform c.g. and the aft isolator. The obvious solution to lower the aft isolator, thus raising the forward isolators creates a second interference problem with the aft cager. The aft cager location has been determined by the crash line of force fore and aft thru the platform c.g.

SCHEME II

A. Description

Quantity and location of reaction points are those three points shown on drawing AX-7. Parts consist of the platform, frame reduced in size, and an intermediate structure to mount frame to reaction points.

B. Advantages

1. Three vehicle reaction points result in greater simplicity of equipment installation.

2. No interference problem between forward low frequency vibration isolators & the air duct.

C. Disadvantages

1. Does not permit location of low frequency vibration isolators for proper load distribution. Reduces isolation efficiency.

2. Intermediate structure adds from 6 to 8 pounds additional weight.

D. Other

1. More knowledge of scheme I problems since more engineering time has been spent on this scheme.

2. Scheme II occupies more central platform space. Less is presently known about location of other equipment in this area.

ADDENDUM II

DATA

I. Vibrations

A. Fuselage

Presented - Curve of 1st three modes of amplitude in vertical direction vs. fuselage stations. Absolute numbers for amplitudes to follow.

Requested - (for caging criteria)

1. Decay time for the above.

2. Frequency & magnitude of wind gusts

B. Engine

1. On ground 50-118 cycles/sec.

2. In flight 85-120 cycles/sec.

3. Air coupling to equipment. Noise to the rear, and going in opposite directions. Wait for actual tests for more information.

II. Navigation

Presented -

1. 1^{o}/sec maximum turn rate; roll 10^{o}/sec.

2. Check points every 1/2 hour.

3. One to two mile maximum deviation from check point.

4. Time back to path - few seconds.

Requested -

More auto pilot information.

III. Other

1. Sidemounts - No longitudinal load, lateral load of 2000# each. Sketch on hand.

2. Location of electric power cable as required by equipment.

3. "Can" problem about six reaction points.

4. Inner profile contour defined.

5. Use AX-7 for fitting locations but not for duct size

and location.

6. Thrust vector on waterline.

7. Azimuth reference at longitudinal center of rear bulkhead.